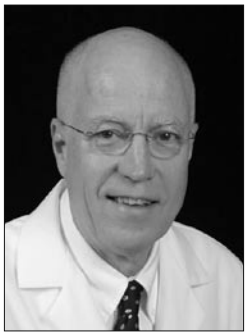
Facts and ideas from anywhere



William C. Roberts, MD

A NATION OF 300 MILLION

In 1800, the US population was just over 5 million; in 1860, 31 million; in 1900, 76 million; in 1950, 151 million; in 2000, 281 million; and as of October 2006, 300 million (1). By 2040, our population is predicted to be 400 million. The USA has added 100 million people since 1967. Only China and India have larger populations. The USA is growing faster than any other industrialized nation. The biggest driver of our growth is immigration—legal and illegal. About 53% of the 100 million extra Americans are recent immigrants or their descendants. Without them, the USA would have about 250 million people. Today, 15% of the US population is Hispanic and 5% is Asian compared with 5% Hispanic and 1% Asian in 1970. The newcomers have transformed an overwhelmingly white population of largely European descent into a multicultural society that reflects every continent on the globe. Some newcomers arrived as war refugees. Most came in search of better opportunities. Once here, they had more babies than nonimmigrants, and as a consequence our birth rate's higher than that of Europe and Japan. The average life expectancy at birth today is 78 years. The percentage of the population ≥65 is now just over 12%. The median age is now 36 years, up from 28 years in 1970. In the USA, we have 1 birth every 7 seconds, 1 death every 13 seconds, and 1 immigrant every 31 seconds. The US population increases by 8500 people every day!

THEN AND NOW

About 7000 generations of humans have inhabited the earth, but in this time humans have never changed as dramatically as they have in the past 100 years (2). American men are nearly 3 inches taller and about 50 pounds heavier than they were 100 years ago. In 1900, 13% of people who were 65 could expect to see age 85; now, nearly 50% of 65-year-olds can expect to live that long. Many chronic ailments such as heart disease, lung disease, and arthritis are occurring at an average of 10 to 25 years later than they did 100 years ago. The average IQ has been increasing for decades, and the risk of having dementia in old age apparently has fallen in recent years. These data come from several investigators but mainly from Dr. Robert W. Fogel, the 1993 Nobel laureate in economic sciences.

FRUITS AND VEGGIES

In 2005, the Department of Health and Human Services and the Department of Agriculture jointly published a new dietary guideline that listed produce requirements by cups rather than by "servings" (3). Presently, about 90% of the US population does not follow the government's recommendations for fruit and vegetable consumption. The push to increase produce consumption comes in part from the growing body of evidence that fruits and vegetables offer even more health benefits than previously understood. They may play major roles in preventing cardiovascular disease, some eye diseases, some intestinal cancers, prostate cancer, and osteoporosis. In 2004, the Institute of Medicine, a federal advisory body, recommended that adult Americans increase their intake of potassium, a mineral that lowers blood pressure and is plentiful in many fruits and vegetables. People who eat fruits and vegetables >3 times a day reduce their risk of stroke and cardiovascular disease by nearly 25% compared with those who eat them less than once a day. Eating lots of fruits and vegetables also may be one of the best ways to lose weight. We need to eat more of certain vegetables, particularly dark green ones like broccoli and brussels sprouts. Presently, the most common vegetables we eat are potatoes, corn, and peas. Canned vegetables are nearly as good as fresh or frozen ones; although some vitamins are lost through the canning process, the fiber remains. The problem with the canned products is that most contain far too much salt.

EMPLOYERS PUSH HEALTHY EATING

Candy bars and junk food in office vending machines are now history in some companies (4). Instead, healthier items are available. Some companies are growing vegetables on corporate campuses, charging employees more for fatty foods, or banning cakes and sweets at company celebrations—mirroring the trend set by schools to limit unhealthy foods. If employees are healthy, health care costs are positively impacted. In break areas, some companies are putting out apples, bananas, and other fruits and not charging for them. Donuts, of course, provide mixed messages. It would be nice to have bananas or other fruits available

at grand rounds at Baylor University Medical Center. What are available are high-caloric sweet foods, things physicians tend to advise against in their offices.

THE OMNIVORE'S DILEMMA

Michael Pollan's newest book is *The Omnivore's Dilemma* (5). He discussed the $36 billion in food marketing dollars ($10 billion directed to kids alone) designed to get us to eat more, to eat more dubious "neofoods," and to eat on more occasions. To eat better he proposed a few "rules":

1. "Don't eat anything your great-great-great-grandmother wouldn't recognize as food."
2. "Avoid foods containing high-fructose corn syrup (HFCS)." HFCS is present not only in cereals and soft drinks but also in ketchup, bologna, baked goods, soups, and salad dressings. HFCS was not part of the human diet until 1975, and now each of us consumes 40 pounds of it a year, some 200 calories a day. Avoiding it avoids thousands of empty calories. Cut out highly processed foods—the ones that contain the most sugar, fat, and salt.
3. "Spend more, eat less." We spend only 10% of our income on food, a smaller share than any other nation, and we spend a larger percentage than any other nation on health care (16%). The cheap food is making us fat and unhealthy. Eat higher-quality food.
4. "Pay no heed to nutritional science or the health claims on packages." The healthiest foods in the supermarket—fresh produce—are the ones that don't make Food and Drug Administration (FDA)–approved health claims, which typically decorate the packages of the most highly processed foods.
5. "Shop at the farmers' market." Here you will begin to eat foods in season, when they are at the peak of their nutritional value and flavor.
6. "How you eat is as important as what you eat." The lesson of the "French Paradox" is that we can eat all kinds of supposedly toxic substances as long as we follow our mother's rule, "Eat moderate portions, don't go for seconds or snacks between meals, never eat alone, and eat with pleasure."

LAPAROSCOPIC LAP-BAND DEVICE VS LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS FOR EXTREME OBESITY

It appears that the gastric bypass procedure is winning. A study in the July 2006 *Archives of Surgery* compared results in 60 patients who received a Lap-Band device through a laparoscopic procedure to those in 43 patients who underwent the laparoscopic Roux-en-Y gastric bypass (6). The former consists of placing a silicone band around the stomach, dividing it into 2 smaller compartments. The latter procedure consists of sectioning off a small portion of the stomach into a pouch that bypasses the first part of the small intestine and connects it directly to the colon, thus reducing the amount of calories absorbed by the body from food. The investigators found that the patients undergoing laparoscopic bypass surgery had fewer long-term complications, lost more weight, and had greater improvement in other comorbidities, including greater reductions in blood pressure, blood sugar, and blood cholesterol levels. Complications occurring >30 days after the operation were more common in the Lap-Band group (78% vs 28%), and the most common complications were vomiting and dehydration. Five patients in the Lap-Band group needed follow-up surgery compared with 3 in the bypass group. The average body mass index decreased by 9.8 kg/m^2 in the Lap-Band group and by 26.5 kg/m^2 in the bypass group. Rates of diabetes mellitus dropped from 17% before surgery to 0 afterwards in the bypass group and from 18% to 11% in the Lap-Band group. All of the patients reported in this study had body mass indices of ≥50 kg/m^2 before the operation.

ADDICTION TRANSFER

Most recipients of bariatric surgery lose an enormous number of pounds, and in many the blood cholesterol, blood pressure, and blood glucose levels fall, often to normal or near-normal levels. According to a recent piece in *The Wall Street Journal*, researchers are observing an unusual phenomenon in the patients who are having this type of surgery: some patients stop overeating but wind up acquiring new compulsive disorders such as alcoholism, a gambling addiction, or compulsive shopping (7). Some psychologists describe it as a type of "addiction transfer," an outcome of substance-abuse treatment, whereby patients swap one compulsive behavior for another. Some researchers are coming to believe that swapping behaviors may have a neurological basis. The biochemical causes of compulsive eating are similar to those underlying other self-destructive addictions such as dependency on alcohol or cocaine. Alcohol use in particular is a concern for bariatric patients because some versions of the surgery can change the way patients metabolize alcohol, making it far more powerful.

THE FAMILY MEAL

Kids who dine with their parents are healthier, happier, and better students than those who do not. Recent surveys have shown that 55% of 12-year-olds have dinner with a parent every night vs 26% of 17-year-olds (8). Among teens, 54% of Hispanics eat with a parent most nights vs 40% of blacks and 39% of whites. The television is on during dinner in 37% of families with teens. The number of family meals, however, appears to be increasing. Groups like Ready, Set, Relax! have dispensed hundreds of kids to many towns, coaching communities on how to fight overscheduling and how to carve out family downtime. More schools are offering basic cooking instruction. When kids help prepare a meal, they are much more likely to eat it, and cooking is a useful skill that seems to build self-esteem.

OVERWEIGHT TODDLERS

Nearly 70% of adults in the USA are overweight. In addition, more heavy babies are being born today than 20 years ago. A new study in *Obesity* indicates that the percentage of babies under 6 months of age who are overweight has increased from 10% in 1980 to 70% in 2001 (9). The percentage of heavy toddlers and preschoolers also has increased substantially in recent years. Many factors contribute to the increase in weight among infants: mothers weigh more when going into pregnancy, and

some gain excessive weight during pregnancy, which makes them more likely to develop gestational diabetes mellitus, which causes more heavy babies.

QUADRUPLETS AFTER TRIPLETS

After delivering triplets in 2003, Angela Magdaleno gave birth to quadruplets on July 6, 2006, by cesarean section (10). She now has 9 children! The latest additions—2 girls and 2 boys—are doing well, and so is their 40-year-old mother. The earlier triplets were born after Ms. Magdaleno underwent in vitro fertilization. She got pregnant with the quadruplets without fertility drugs. The babies were born at 32 weeks, well beyond the 29-week average for quadruplets. The girls were each 4 pounds and 17 inches long, and the boys were 3.5 pounds and 16 inches long. The odds of conceiving quadruplets without fertility drugs are about 1 in 800,000. Even rarer, the boys appear to be identical twins. The quadruplets are expected to be in the hospital about 2 months. All 11 family members will be living in a 1-bedroom apartment in East Los Angeles!

CIGARETTE TAXES

Several states have demonstrated that increasing cigarette taxes reduces cigarette smoking. California has a proposal (Proposition 86) on the November 2006 ballot to increase the tax on cigarettes to $3.47 a pack from the current 87¢, a 300% increase (11). Similar increases would apply to cigars and other tobacco products. The increase would send the average price of a pack of cigarettes from $4.00 to $6.55 in California. Since 2000, 42 states have raised cigarette taxes. Presently, the median state tax per pack is 80¢, and the federal tax is 39¢. As of August 2006, the states with the highest tax per pack of cigarettes are Rhode Island ($2.46), New Jersey ($2.40), Washington ($2.03), Maine ($2.00), and Michigan ($2.00). In contrast, the states with the lowest taxes are all in the South: South Carolina ($0.07), Missouri ($0.17), Mississippi ($0.18), Tennessee ($0.20), Kentucky ($0.30), and Virginia ($0.30). I am glad that Texas is not on that lowest list. The Government Accountability Office argues that as cigarette taxes increase, so do the incentives for criminal organizations, including terrorist organizations, to smuggle cigarettes into the USA. I am for the high cigarette taxes because non–cigarette smokers pay for a higher percentage of smoking-related illnesses than do the cigarette smokers.

SECONDHAND SMOKE

A new 700-page report from the US Surgeon General provides conclusive evidence of the harm of secondhand smoke and suggests that smoking bans are the only way to protect nonsmokers (12). Although many states and hundreds of cities have passed smoke-free laws, >125 million Americans aged >3 years continue to be exposed to secondhand smoke. It is estimated that in the USA secondhand smoke annually kills 46,000 adult nonsmokers from heart disease, 3000 adult nonsmokers from lung cancer, and 430 newborns from sudden infant death syndrome. In children, secondhand smoke apparently causes nearly 800,000 ear infections, 2000 episodes of asthma, and at least 24,000 low-birth-weight or premature deliveries. The report indicates that 40% of nonsmoking adults and nearly 60% of children aged 3 to 11 years are exposed to secondhand smoke in the USA. Because children's lungs are still developing, children exposed to smoke have twice the adult level of a nicotine byproduct in their blood.

SMOKELESS TOBACCO

Of the total US population of 300 million, 46 million smoke. Each year, 400,000 die because of it. Fewer than 5% a year kick the habit. Smokeless tobacco is 10 to 1000 times less harmful than cigarettes, and it could help people quit smoking (13). Smokeless tobacco, however, like smoking, can cause oral cancer. It does not cause the many other deadly diseases associated with cigarettes, including emphysema, lung cancer, and cardiovascular disease. Smokeless tobacco, of course, is not a perfect solution to cigarette smoking, but it would keep a lot of people alive until a better solution comes along.

SOBRIETY CHECKS

Texas is one of 12 states that do not use sobriety checkpoints (14). Fatalities caused by impaired motorists have made drunken driving a serious societal issue. In 2005, 251 people died in alcohol-related crashes in the Dallas–Fort Worth area, according to the National Highway Traffic Safety Administration. Recently, the mayors of Dallas, Fort Worth, and Arlington met to announce a campaign to push for state legislation allowing police to conduct sobriety checkpoints. Arlington is forming a driving while intoxicated task force to get impaired drivers off the roads and to revoke the licenses of bars and restaurants that oversell alcohol. Members of Mothers Against Drunk Driving, of course, applaud the initiative.

COST OF CANCER DRUGS—ARE THEY WORTH IT?

Gleevec was approved in 2001, and several other cancer drugs have been produced subsequently (15, 16). They all have one thing in common with Gleevec: they are incredibly expensive *(Table)*. These drugs are not curative. Patients still do not live very long on most of the new medications. Survival for patients with advanced colon cancer, for example, has increased from 1 to about 2 years over the past decade. Many of the new

Table. Various cancer treatments and costs*

Drug	Company	Monthly cost
Avastin	Genentech	$4400
Erbitux	ImClone/Bristol-Myers	$10,000
Gleevec	Novartis	$2600
Herceptin	Genentech	$3000
Nexavar	Bayer Pharmaceuticals	$4300
Revlimid	Celgene	$4500
Rituxan	Genentech	$4200–$13,000†
Sutent	Pfizer	$4000
Tarceva	Genentech/OSI Pharmaceuticals	$2400–$2700†

*From *USA Today* (15), a division of Gannett Co., Inc. Reprinted with permission.
†Cost varies with type of cancer treated.

drugs, unlike Gleevec, work only when combined with chemotherapy. Adding drugs, such as Erbitux and Avastin, to older therapies increases costs as well as side effects. Because most of these cancer drugs improve survival by only a few weeks or months, are they worth it?

ARAVIND EYE HOSPITAL IN INDIA

Govindappa Venkataswamy (Dr. V), an ophthalmologist, died on July 7, 2006, at age 87 (17). In 1976 at age 58, he opened Aravind Eye Hospital in Madurai, India, along with 2 other doctors, his sister and her husband, both ophthalmologists. Subsequently, his model became a 5-hospital assembly-line system. In India, by some estimates, there are 20 million blind eyes, 80% of which are due to curable cataracts. "A blind person is a mouth with no hands," stated Dr. V. The Aravind system offers services that range from a simple pair of spectacles to optical oncology. The bulk of surgery, however, is to treat cataracts—removing the cataract and replacing it with an artificial intraoptical lens. The assembly-line approach is most evident in the operating room, where each surgeon works 2 tables, one for the patient having surgery, the other for the patient being prepped. In the operating room, the doctors use state-of-the-art equipment such as operating microscopes that can swivel between tables. The surgeons typically work 12-hour days, and the fastest can perform up to 100 operations in a day. The average is 2000 operations annually per surgeon, nearly 10 times the Indian national average. Despite the crowding and speed, complication rates are low.

Outside the operating rooms, conditions are spartan, often only a straw mat on a ward floor for postsurgical recovery. Most patients pay only $40 per operation, but if they have no money, the surgery is free. About 30% of the patients pay more than $40 and have private rooms and hot meals. Beginning in 1945, Dr. V developed severe rheumatoid arthritis that greatly deformed his hands. After long therapy, he trained his gnarled fingers to manipulate a surgeon's scalpel. With the grueling work and the government-comparable pay, 25% of the professional staff leave each year for better-paying jobs in the private sector.

"THE END OF MEDICINE"

Andy Kessler has written *The End of Medicine: How Silicon Valley (and Naked Mice) will Reboot Your Doctor* (18–20). The former research analyst and investment banker spent 20 years on Wall Street analyzing and investing in technology. He ran a successful hedge fund for 5 years. His last book was *Running Money.* He is looking for the new quantum leap, an entire industry created overnight from some new technology. He believes his best hope is in health care. He is seeking early detection of disease; he thinks that molecular imaging may change everything. He wants a seismic shift in medicine from chronic care to early detection technology, from a service business to a product. Presently, he opines that physicians hold the expertise and that they totally control medical care. In other industries, expertise is increasingly imbedded elsewhere: in software, silicon, cell phones, or search engines. Kessler essentially wants to smooth down the rough efficiencies in health care by digitizing medical records and joining physicians, patients, and payers in a streamlined or online system. He wonders why medicine cannot scale the way computers do. In information technology, everything can be reduced to chips, which keep getting smaller and cheaper, making costs go down. In medicine, everything works the opposite way: costs keep going up.

"CANADIAN" PRESCRIPTION DRUGS

Canada is becoming a clearinghouse for drugs made outside its borders specifically for the American public. Last year, according to a piece by Marv Shepherd (21), the FDA investigated Canadian Internet pharmacies and found that 85% of the so-called Canadian sites shipped products from 27 different countries, including India, Israel, Costa Rica, and Vanuatu. Some sites illegally sell generic versions of medications with US patents, and, therefore, it is incorrect to call these "Canadian drugs." Who knows where they were truly manufactured or whether they meet Canadian or US standards.

FDA and Customs are well aware that illegal medications reach the USA. At the last FDA border investigation, 88% of the medicines were "violative," meaning that they could be counterfeit, expired, substandard, or adulterated. They certainly were not FDA-approved products. Health Canada, Canada's equivalent to our FDA, protects medicines for Canadian citizens and has stated clearly that it will not guarantee medicines mailed to US citizens. In fact, drugs intended for export from Canada do not require approval from Health Canada.

The amount of drug counterfeiting is expected to double by 2010. Money raised from drug counterfeiting has been used to fuel many questionable industries. North Korea, for example, is producing counterfeit pharmaceuticals to finance its military-industrial complex. The federal Joint Terrorism Task Force recently unsealed an indictment of a global terrorist ring that was importing counterfeit drugs from Asia to Canada for sale in the USA. A significant amount of profits from this counterfeit operation supported Hezbollah.

It is understandable that the Senate would vote to help constituents lower their prescription-drug costs. We do not save money, however, if we turn a blind eye to the illegal economy of drug importation. What we do is enrich the wrong people, reward illegal behavior, undermine our own security, and jeopardize the health of Americans. When it comes to medicine, Canada is no longer Canada.

INCREASING "SELF-PAY" FOR HOSPITALIZATION

Many in the USA have lived the illusion that paying for hospital care is somebody else's (or nobody's) responsibility. But a growing number of patients are becoming responsible for a large share of their hospital bills because of various forms of consumer-directed health insurance plans backed by their employers (22). The health maintenance organization held the consumer responsible for about 1.5% of his or her expenses. The new system raises the consumer share to ≥30%. At General Motors, blue-collar workers pay roughly 7% of their health bills out of pocket, but soon they will pay 27%, similar to the company's white-collar workers. Even Medicare and Medicaid

are headed in this direction, although they guarantee hospitals 70% on the dollar for copays and deductibles that aren't collected from patients.

Hospitals manage to collect just over 40% of copays and deductibles from customers with insurance, and they collect none of course from the uninsured. Federal law requires hospitals to treat all emergency cases regardless of ability to pay. Hospitals do not get sufficient credit for this nearly $30 billion unfunded mandate—the largest imposed on any business. In the past, government has bailed out hospitals. Again, according to Mr. Jenkins, hospitals are just now getting credit card data on patients before treatment. One hospital, looking at procedures that exacerbated its bad debt problem, found that nobody was stopping emergency room patients from walking out the back door without passing the cashier. Whether "self-pay" will transform how the $660 billion hospital industry does its future business will be interesting to watch.

PATIENTS WHO SPEAK NO ENGLISH

From 1990 to 2000, the number of US residents with limited English proficiency grew from 7 million to 21 million, or 8% of the total population (23). Under Title VI of the Civil Rights Act of 1964, the denial or delay of medical care because of language barriers is "discrimination." Any medical facility that receives Medicaid or Medicare must provide language assistance to patients with limited English proficiency. In 2003, California also passed legislation requiring health care providers to make interpreters available to those who need them. The American Medical Association (AMA) says that making health care providers responsible for the cost of an interpreter is unfair. An AMA survey found that the cost of hiring an interpreter varied from $30 to $400 an hour, depending on language skill level, significantly higher than the payment for a Medicaid office visit, which in many states is from $30 to $50. The most common languages for which interpreters are needed are Spanish, Chinese (Cantonese and Mandarin), Tagalog (Filipino), Vietnamese, Korean, and Russian.

ALTERNATIVE MEDICINE OUTPATIENT CLINIC

Bernard Osher, a San Francisco businessman who made his fortune through investment in Gold West Financial Corporation and an auction house, recently gave the Brigham & Women's Hospital in Boston a gift of $5 million to create an outpatient center to test alternative therapies including massage, acupuncture, and meditation (24). Mr. Osher's interest in alternative medicine was sparked by a 1985 trip to China where he received alternative treatments, including acupuncture. He wants to prove that these alternative therapies work.

TRANSIENT PEACE IN THE MIDDLE EAST

The citizens of Israel are surrounded by 158 million people who do not like them. Of the 18 Middle Eastern and North African countries, only one is considered "free," i.e., Israel (25). The US State Department has named 42 groups in its list of designated foreign terrorist organizations. Of those, at least 5 have a home base in Lebanon. Hezbollah is an important player in Lebanese politics. The terrorist group has 14 seats in the 128-member Lebanese parliament; it has 2 ministers in government and 1 more endorsed by Hezbollah. Hezbollah has roughly 2500 to 3500 members, of which 300 are guerillas and carry out the attacks. Israel has about 168,000 in its armed forces. Israel received nearly $49 billion in US foreign aid between 1960 and 2004, more than any other country. Egypt received $43 billion, followed by India, Vietnam, Pakistan, and South Korea.

SHIITE MUSLIMS VS SUNNI MUSLIMS: SECTARIAN SPLIT IN THE MIDDLE EAST

The percentage of the population that is Shiite in the various Middle Eastern countries is as follows (total population): Lebanon, 45% (4 million); Syria, 16% (19 million); Iraq, 63% (27 million); Iran, 89% (69 million); Kuwait, 25% (2.4 million); United Arab Emirates, 15% (2.6 million); Saudi Arabia, 10% (27 million); Jordan, <1% (6 million); and Egypt, 1% (79 million) (26). The countries with small Shiite populations have large Sunni populations. The schism between Shiites and Sunnis dates back to the Prophet Muhammad's death in 632. The forebearers of the Sunnis chose Muhammad's close friend and father-in-law, Abu Bakr, to succeed him and become Islam's first caliph. Shiites believed Muhammad's son-in-law, Ali, was more deserving. Today, the conflict is most visible in Iraq, where foreign and local Sunni insurgents refuse to accede to the country's Shiite majority. As Vali Nasr argues in his new book, *The Shia Revival: How Conflicts Within Islam Will Shape the Future,* the backlash in Iraq is stimulating a wave of similar sectarian battles from Lebanon to Pakistan, where the populations of the 2 sects are roughly equal. In the coming years Shiites and Sunnis will compete over power, first in Iraq but ultimately across the entire region.

For the USA, the Sunni-Shiite divide is fraught with challenges and opportunities. By creating in Iraq the first Shiite-led state in the Arab world since the rise of Islam (Iran is mostly ethnic Persian), the US ignited aspirations among some 150 million Shiites in the region, many of whom live under Sunni rule. According to Vali Nasr, the USA has long relied on its traditional Sunni Arab allies—Egypt, Jordan, and Saudi Arabia—to keep the Arab-Israeli conflict in check. But now, the Sunni axis is failing, says Mr. Nasr, because these nations are incapable of containing a resurgent Iran and its radical clients on the front lines against Israel—Hezbollah and the Palestinian group Hamas. Nasr argues that the USA must "recalibrate" its diplomacy and reestablish contacts with Iran. That would require disavowing any interest in regime change in Tehran but would offer the best hope of moderating Iran's growing influence. Cairo, Amman, and Riyadh have lost control of the region, and if we continue to exclude Iran, opines Nasr, we had better be prepared to spend a lot of money on troops in the region for a long time.

Mr. Nasr sees 2 main threats arising from today's Shiite revival. The first is Iranian nationalism fueled by perceptions in Iran that a Sunni Arab–US nexus wants to stifle its rise as a regional power. That explains the widespread support among Iranians for their country's nuclear program. It also explains

why some Iranian leaders have been sounding less like Islamic revolutionaries and more like the late shah, a Persian nationalist who extended Iran's influence into Shiite and Farsi-speaking areas beyond its borders.

The second major threat, he says, is the Sunni reaction to the Shiite revival. As Iraq's insurgents have shown, hatred of Shiites is ingrained in Sunni militancy. He worries about a replay of the 1980s and 1990s when Saudi money poured into Sunni extremist groups throughout the region to counter the Shiites' fervor coming out of Iran after the revolution. The same group became the backbone of al-Qaeda. One optimistic note: Nasr says US and Iranian interests in Iraq may converge because both want lasting stability there. It is important to manage the rise of regional powers. "You can't regulate them by isolating them."

Thomas Friedman hit it on the head (27):

> What we are seeing in Iraq, the Palestinian territories and Lebanon is an effort by Islamic parties to use elections to pursue their long-term aim of Islamizing the Arab-Muslim world. This is a power struggle within Lebanon, Palestine and Iraq over who will call the shots in their newly elected "democratic" governments and whether they will be real democracies.
>
> The tiny militant wing of Hamas today is pulling all the strings of Palestinian politics; the Iran-backed Hezbollah Shiite Islamic party is doing the same in Lebanon, even though it is a small minority in the cabinet; and so, too, are the Iranian-backed Shiite parties and militias in Iraq. They are not only showing who is boss inside each new democracy, but they are also competing with one another for regional influence. . . . The little flowers of democracy that were planted in Lebanon, Iraq and the Palestinian territories are being crushed by the boots of Syrian-backed Islamic militias who are desperate to keep democracy from taking hold in this region and Iran-backed Islamic militias who are desperate to keep modernism from taking hold. . . . The whole democracy experiment in the Arab-Muslim world is at stake and it's going up in smoke.

DRESSED FOR WINTER IN SUMMER IN IRAQ

In July, August, and September in Baghdad, the high monthly temperatures average about 110°F. In a recent week in August, the average Baghdad temperature was 115° (28, 29). Fortunately, the humidity is low because it is a desert. The dress of the US soldiers in Iraq is not ideal for that type of heat. They wear long-sleeved uniforms, flak jackets with ceramic plates in the front and back (and soon to be on both sides), Kevlar helmets, and boots and carry M-16 rifles with >100 rounds of ammunition. The total weight of this gear is 30 to 40 pounds. Nevertheless, the number of US troops hospitalized due to Iraq's sweltering heat has dropped from 106 in 2003 to only 30 hospitalizations in 2006. Six service members died in Iraq of heat stroke in 2003 but so far none in 2006.

The army is doing what it can to prevent heat exhaustion, heat stroke, or worse. Hydration is a key: the soldiers require at least 14 liters of water a day, or about 3.7 gallons. Many drink up to 21 liters a day. Unit leaders train to look for early signs of heat exhaustion: pallor, dizziness, slurred speech, and confusion. Most missions are now launched at dawn or dusk to avoid the midday heat. The military is looking into buying vests that create a space between the body and vest to allow air to circulate. And it is also considering a battery-operated version that circulates a cool liquid through the vest. New units do not begin deployment in the summer, a tactic giving them time to acclimate before temperatures soar. Refrigerators and air-conditioning units have been installed in checkpoints around the Green Zone. Soldiers alternate between guard duty (hot) and monitoring security screens (air-conditioned). Thus, our good soldiers have another enemy in Iraq to contend with, the heat.

IRAQI INSURGENTS' SNIPER TECHNIQUES

The US military intelligence recently obtained training material used by the Iraqi insurgents. They teach recruits sniper techniques, including singling out US engineers, medics, and chaplains "as a means of psychological warfare" (30). The insurgent manual also advises snipers to target US officers because they are hard to replace, tank drivers because their deaths can immobilize tank crews, and communication officers because their deaths could delay calls for reinforcements. The manual, translated into English by US intelligence, advises snipers to avoid large groups of soldiers. It ranks Iraqi government forces as lower-priority targets that can be attacked by less well-trained combat brigades. US intelligence discovered the manual in May 2005 on a website that appears to be no longer functioning. The insurgent snipers are said to be well trained, often work in 2-man teams, can shoot around body armor, and have easy access to weapons from stockpiles left by the former regime of Saddam Hussein.

OLDER SOLDIERS

The US Army has lowered the minimum physical requirements needed to pass basic training so it can recruit older soldiers (31). In June 2006, the army raised the enlistment age limit to 42. So far, only five people ≥40 and 324 ≥35 have enlisted in the army. The army has the military's highest age limit. The US Air Force and US Marines' age limits are 27; and the US Navy's, 35. The army, which supplies most of the troops for the wars in Iraq and Afghanistan, is on track to meet its recruiting goal of 80,000 new soldiers in 2006. In 2005, the army recruited just over 73,000 new soldiers. These older recruits may explain why the number of heart attacks is increasing in our soldiers in Iraq and Afghanistan.

HEAT WAVE

During the past century, global average temperatures rose about 1°F, largely because of human contributions to the "greenhouse" gases that capture heat in the atmosphere. Such contributors include carbon dioxide emitted by burning coal, oil, and other fossil fuels. The 2006 summer's heat wave extended across the entire continental USA (32–34). Simultaneous heat waves occurred in Europe. The United Kingdom (UK) suffered its warmest July on record. Global warming is projected to raise average temperatures worldwide about 3° to 9°F in this century. Warmer temperatures increase the likelihood of extreme weather such as heat waves, which will become more frequent. In the future, global warming may create stronger and larger high-pressure "domes" of air that block cool air from entering

the regions they cover. Global warming appears to have been a contributing factor in Europe's 2003 heat wave, which was blamed for 35,000 deaths.

The USA's 48 contiguous states had an average temperature of 77.2°F in July 2006, the National Climatic Data Center reported, just shy of the record of 77.5°F set in July 1936 and well above the monthly average of 74.3°F (35). These figures are based on average temperature readings from hundreds of weather stations nationwide. The July 2006 heat wave caused at least 140 deaths in California. July's hot weather set >2300 records for daily high temperatures nationwide, mostly in the Midwest and West. An additional 3200 records were logged for the warmest nighttime temperatures. That helped make the 7-month stretch from January through July 2006 the hottest such period in the USA since government record keeping started in 1895. Consequently, residential customers across the USA used 22% more electricity than they would have if July temperatures had been closer to average. Across the Plains, hot weather magnified a drought that has scorched the ground so badly that some farmers are chopping down their damaged crops rather than harvesting them. More than half of the country now faces at least a moderate drought.

Some investigators at California's Scripps Institution of Oceanography found that higher temperatures, causing earlier snow runoff and consequently drier summer conditions, were the key factor in the explosion of big wildfires in the US West over the last 3 decades (36). Researchers previously reached similar conclusions in Canada, where fire now destroys an average of 6.4 million acres a year, compared with 2.5 million in the early 1970s. In drought-stricken Australia, 2005 was the hottest year on record, and the dangerous bushfire season is growing longer. The same is occurring in Siberia. The average winter temperatures in Siberia in the 1980 to 2000 period were 3.6° to 7.2°F warmer than the pre-1960 norm. The Scripps study, published in *Science,* was unique in collating detailed data from 34 years of US western wildfires with temperature, snowmelt, and stream flow records. Wildfire frequency varies widely from year to year, but these investigators found a clear trend: the average number of large fires almost quadrupled between the first and second halves of that period.

DIABETES "POLYPILL"

At the American Diabetes Association's annual meeting in June 2006, President Robert A. Rizza proposed a "polypill" treatment for patients with diabetes mellitus (37). The daily pill would contain 1000 mg of metformin, 75 mg of aspirin, 40 mg of a generic statin, and 10 mg of a generic angiotensin-converting enzyme inhibitor. Such a pill would cost about $100 per year and could reduce total serious diabetic complications by nearly 25%. Rizza calculated that this pill for diabetics would prevent 1.5 million myocardial infarcts, 600,000 cases of renal failure, and 1,000,000 cases of blindness or eye surgery over the next 30 years. He also suggested that if 100% of the 21 million people with diabetes in the USA received optimal care (hemoglobin A_{1c} level <7%, blood pressure <130/80 mm Hg, body mass index <25 kg/m^2, daily baby aspirin, no smoking, and daily statin), $325 billion would be saved, 3.5 million fewer people would die, and 18 million fewer life-changing diabetic complications would occur over the next 30 years.

GENDER DIFFERENCES

David Brooks, columnist for *The New York Times*, writes that there are 3 gender-segregated sections in any airport: restrooms, security pat-down areas, and bookstores (38). Researchers in the UK asked 400 accomplished women and 500 accomplished men to name their favorite novels. The men preferred novels written by men, often stories revolving around loneliness and alienation: *The Stranger*, *Catcher in the Rye*, and *Slaughterhouse-Five* topped the male list. The women leaned toward books written by women. The women's books were of higher quality and tended to focus on relationships: *Jane Eyre*, *Wuthering Heights, The Handmaid's Tale, Middlemarch, Pride and Prejudice,* and *Beloved.* Male and female brains work differently. Women use both sides of their brain more symmetrically than men do. Men and women hear and smell differently, and boys and girls process colors differently (young girls enjoy an array of red, green, and orange crayons whereas young boys generally stick to black, gray, and blue). Men and women experience risk differently (men enjoy it more). There are biological differences between boys and girls.

In most classrooms, boys and girls are taught the same books in the same way, but boys are falling behind. In recent years, the percentage of young men who read has plummeted. Reading rates are falling 3 times as fast among young men as among young women. Men are drifting away from occupations that involve reading and school. Men now make up a smaller share of teachers than at any time in the past 40 years. Leonard Sax, the author of *Why Gender Matters*, is a big believer in single-sex schools, which he says allow kids to open up and break free from gender stereotypes. That is probably good advice.

NUMBER TWO IN SPACE

The offshoots for medicine and technology from our space program have been enormous. We won the race to the moon because President John F. Kennedy convinced Congress and the public that we could not be comfortable as number 1 on earth unless we were also number 1 in space (39). So we geared up and beat the Russians to the moon, but soon thereafter we lost interest. The Russians have had >2000 manned and unmanned space missions. The USA has had <1000. Russian cosmonauts have spent the equivalent of 3 times as many hours in space as US astronauts. Not only have we played second fiddle to Russia in recent years, but we are in danger of becoming third-raters in space. China has launched humans into space and has announced that it plans a permanent base on the moon. As Neuharth points out, "We cannot fight wars and fund the space programs adequately at the same time" (39).

MORE ADULT FOCUSED

The USA is becoming a more adult-focused society after being child-centered for decades. Longer life expectancy, delayed marriage and childbearing, and increased childlessness

add up to a longer life without kids (40). Child rearing occupies a smaller share of a person's adult life because there are longer periods before and after raising children compared with previous generations. In 1970, for example, 74% of women aged 25 to 29 had at least one minor child at home; in 2000, 49% did. In 1970, the most common household was married couples with children; now, single, childless households are the most prevalent. Today, more women in their 40s are childless: in 1976, 1 in 10 were childless; in 2004, 1 in 5.

MOST INVENTIVE TOWNS IN THE USA

The cities with the most patents overall, combining those of large companies and individual inventors, include 3 from Texas: Austin, #3; Houston, #11; and Plano, #17 (41). Eight of the 10 most inventive towns in 2005 were located in California. The number 1 city, San Jose, had twice as many patents as the number 2 city, Sunnyvale (3867 vs 1881).

IMPLANON

On July 17, the FDA approved the long rod designed to be inserted underneath the skin of the upper arm to serve as a contraceptive to prevent pregnancies for as long as 3 years (42, 43). Implanon provides 99% contraceptive protection and will be the first contraceptive implant to be sold in the USA since 2000. Implanon has been sold in >30 countries since 1998, and >2.5 million women have used it. Implanon releases a low, steady dose of progestin to prevent pregnancy. Its use can cause irregular bleeding and spotting. In some women, it eliminates monthly periods altogether. The rod must be removed after 3 years although it can be taken out any time before then. The implant is said to be less effective in women who are >30% over ideal body weight. Implanon has several side effects, the most serious being vascular thrombosis. If pregnancy is desired, Implanon can be removed and fertility returns quickly. Only physicians who take a 3-hour training course in how to implant and remove Implanon will be allowed to order it. Training will begin in late August 2006, and Implanon should be available throughout the USA in early 2007.

FUNERAL PLANNING

Make your wishes for final arrangements known to your family and friends (44, 45). That spares your survivors the task of trying to figure out what you would have wanted. It can also save money. The average funeral cost is $6500 according to the National Funeral Directors Association, but some traditional funerals with a casket, limousine, a viewing, and burial can exceed $20,000. Talk to several funeral homes and compare prices. Do not be talked into buying the most expensive casket in the showroom. A federal law, known as the Funeral Rule, is designed to protect consumers from unscrupulous funeral home operators. Among its provisions:

1. A funeral home must provide you with an itemized price list of its products and services. Items usually include the fees for services, transportation, and care of the body; costs of providing facilities and staff for a wake or viewing; flowers; music; and preparation of obituary notices. Products and services can be chosen from the price list. The funeral home is required to give you a free copy of the price list when you visit. It is also required to tell you its prices over the phone. If a funeral director refuses to do so, suggesting instead that you come in for an appointment, that should be a warning sign.
2. If state or local law requires you to buy a particular service, the funeral provider must disclose it on the price list along with a reference to the law.
3. When visiting a funeral home, the director is required to show a list of caskets the company sells, along with descriptions and prices, before showing you the caskets. This rule is designed to prevent funeral homes from steering you to the most expensive models. If you buy your casket from somewhere else, the funeral home cannot refuse to provide services. And it can't charge you an extra fee. This is an important provision because a casket is expensive, from $2000 to $10,000.
4. If you want a direct cremation, which means there will be no visitation or viewing, the funeral home can't require you to buy a casket. Upon request, the funeral home must offer an unfinished wood box or other alternative containers.
5. Funeral homes are barred from requiring embalming if you plan to be buried or cremated shortly after death. Except in certain cases, embalming isn't required by law.

Many funeral homes allow individuals to pay in advance for their funerals. These prepaid plans appeal to people who prefer not to burden their families with funeral costs. Some prepaid plans are cash-value life insurance policies that cover funeral costs. In other cases, funeral homes invest your money in a trust. Federal law covers these plans, but state regulation is uneven. Some families have lost their money when a funeral home went out of business. Others have discovered, after moving to another state, that their plan was nontransferable. Although they produce lots of complaints, prepaid funeral contracts offer certain advantages. They are not considered assets for purposes of determining eligibility for Medicaid. If you end up in a nursing home, the state cannot force you to use the money in your prepaid contract to pay for your care before you become eligible for Medicaid.

There are other ways to set aside money for your funeral. You can set up a payable on death (POD) account at your bank, naming the person you want to handle your arrangements as the beneficiary. These accounts do not have to go through probate, the often lengthy process by which a court distributes your assets. When you die, the money will go immediately to the beneficiary and will be available for your funeral. Unlike with a prepaid contract, you maintain control of the money. If you need funds for medical expenses, you can withdraw your money from the POD account.

Once you have decided on your final arrangements, write a letter of instruction for your survivors. Make sure it is in a place they can get to quickly. Any decisions about organ or body donations need to be made within hours of death. If you want family and friends to make charitable contributions in your name, your survivors need to include that information in the obituary.

Putting your letter of final instruction in a safe deposit box is not a good idea. If death occurs on a weekend or holiday, your family may not be able to get into your safe deposit box until the bank opens. In some states, opening the safe deposit box can take weeks. Attaching your letter of final instructions to your will is not wise either, because the will might not be found and read until several weeks after your death. Instead, store your instructions at home and make sure your executor or someone else you trust knows where to find it.

Along with instructing relatives about the disposition of your remains, written instructions offer a way to help them plan your wake or memorial service. You can specify the location, the type of music, food, and drink, and even the guest list. Services and memorials are more meaningful if the deceased person's wishes are followed. Melanie Cullen, the author of *Get It Together: Organize Your Records So Your Family Won't Have To* (44), is the expert on these matters.

FIVE BEST SCIENCE BOOKS

The physicist Russell Seitz called these books the 5 best science books (46):

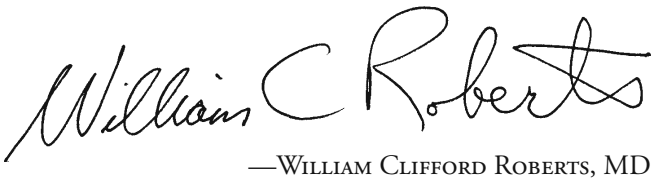
1. *De Re Metallica,* by Georgius Agricola (1556). This Elizabethan classic is technology's first do-it-yourself manual, teaching readers how to make iron from scratch, how to coin silver, and how to connect a water wheel in a valley to a mine pump halfway up a mountain, among many other things. Herbert Hoover, the mining engineer and president, translated this book into English in 1912.
2. *Promethean Ambitions,* by William R. Newman (2005), a history of alchemy. The author explains that the failure to distinguish good science from bad has led to policy disaster for centuries.
3. *Bedrock*, edited by Lauret E. Savoy, Eldridge M. Moores, and Judith E. Moores (2006). This book is about the earth—faults, earthquakes, tsunamis, ice.
4. *Longitude,* by Dava Sobel (1995). While mariners knew how to determine latitude, they didn't know how to determine their east-west position. This book recounts the drama of John Harrison's 18th-century invention of the chronometer, which touched off a second industrial revolution in precision instruments and propelled the world from the use of sextants to electronics and finally to satellite-driven navigation.
5. *Cosmos*, by Alexander von Humboldt (1845). Von Humboldt, a 19th-century scientific superstar, toured the tropics in the early 1800s and inspired Darwin's voyage on the *Beagle* a few decades later. He completed a 20,000-foot climb in the Andes, for the first time encountering the thin air of the "Death Zone." He also discovered the connection between the Amazon and the Orinoco rivers and helped Jefferson plot Lewis and Clark's trip to the West in 1804. Late in life, he wrote this 5-volume overview of the universe. For a brief time, *Cosmos* outsold the Bible.

INHERITANCE

Some fallout continues over Warren Buffet's recent decision to give most of his multibillion dollar fortune to the Bill & Melinda Gates Foundation rather than leaving it to his 3 grown children (47, 48). In contrast, Malcolm Forbes left $400 million to his first son, Steve, the brilliant editor in chief of *Forbes* magazine. Steve and his family have used that money to greatly enhance the Forbes media empire and to provide certain public services. Al Neuharth, a hero of mine and the founder of *USA Today*, listed what he thinks parents owe kids: a safe, healthy, happy home environment; encouragement to learn and to do their best at work and play; a good education, through college; a financial helping hand in starting their careers; and a significant share of any inheritance (along with other family and worthy organizations) (48).

BATS

Some facts on free-tailed bats (49): a naked tail extending past its wing membrane gives the free-tailed bat its name. Each bat weighs <1 ounce. Each flies 40 to 60 miles per hour. Free-tailed bats are mammals and bear live young. The Hill Country of Texas contains one of North America's highest densities of bats, estimated to be 100 million. These bats consume an estimated 930 tons of insects each night. Bats like the Hill Country because of its natural and manmade caves. When bats relax, their grip increases, making it easy for them to hang upside down to sleep. Echo-locating bats can detect something as fine as a human hair. Bat wings tear easily but heal quickly. Hill Country bats spend their winters in Mexico. Bats are not blind. Newborn bats learn to fly in about 6 weeks. In a colony of millions, a mother bat knows her own pup.



—William Clifford Roberts, MD
17 August 2006

1. El Nasser H. A nation of 300 million. *USA Today,* July 5, 2006.
2. Anonymous. Humans today hardly resemble ancestors. *Dallas Morning News*, July 30, 2006.
3. Wang S, McKay B. More reasons to eat your veggies. *Wall Street Journal*, July 25, 2006.
4. Armour S. Employers push healthy eating. *USA Today*, July 5, 2006.
5. Pollan M. *The Omnivore's Dilemma: A Natural History of Four Meals.* New York: Penguin Group, 2006 (464 pp).
6. Browne WB, Julliard K, Castro AE, Shah P, Morgenthal CB, Ferzli GS. Laparoscopic gastric bypass is superior to adjustable gastric band in super morbidly obese patients. A prospective, comparative analysis. *Arch Surg* 2006;141(7):683–689.
7. Spencer J. The new science of addiction. *Wall Street Journal,* July 18, 2006.
8. Gibbs N. The magic of the family meal. *Time*, June 12, 2006.
9. Hellmich N. Study: more babies are overweight. *USA Today*, August 10, 2006.
10. Associated Press. Quadruplets born to triplets' mother. *Dallas Morning News*, July 14, 2006.
11. Welch MW. Calif. cigarette tax could skyrocket. *USA Today*, July 24, 2006.
12. Szabo L. Secondhand smoke debate 'over.' *USA Today*, June 28, 2006.
13. Chapman S. Could this . . . replace this? *Dallas Morning News*, July 17, 2006.

14. Dennis D. Mayors call for sobriety checks. *Dallas Morning News*, August 5, 2006.
15. Szabo L. Prices soar for cancer drugs. *USA Today,* July 11, 2006.
16. Szabo L. Cost of cancer drugs crushes all but hope. *USA Today*, July 11, 2006.
17. Miller S. McSurgery: a man who saved 2.4 million eyes. *Wall Street Journal*, August 5–6, 2006.
18. Kessler A. *The End of Medicine: How Silicon Valley (and Naked Mice) Will Reboot Your Doctor*. New York: Collins, 2006 (354 pp).
19. Hannon K. Medicine + tech = great investment (someday). *USA Today*, July 24, 2006.
20. Tucker W. The art of navigating arteries. *Wall Street Journal*, July 18, 2006.
21. Shepherd M. Canadian pharmacies are a true menace. Drugs from Canada aren't *really* from Canada, and their profits support terrorists worldwide. *Dallas Morning News*, August 5, 2006.
22. Jenkins HW Jr. A specter stalks the hospital biz. *Wall Street Journal*, August 2, 2006.
23. Flores G. Language barriers to health care in the United States. *N Engl J Med* 2006;355(3):229–231.
24. Beatty S. Beyond mainstream medicine. *Wall Street Journal*, July 28, 2006.
25. Anonymous. US Mideast diplomacy: let the fighting go on. *Wall Street Journal*, July 29–30, 2006.
26. Nasr V. *The Shia Revival: How Conflicts Within Islam Will Shape the Future.* New York: Norton, 2006 (289 pp).
27. Friedman T. Can democracy survive in the Arab world? *Dallas Morning News*, July 15, 2006.
28. Jervis R. Troops do battle in, and against, searing heat. Military relies on vigilance, discipline and lots of water. *USA Today*, August 8, 2006.
29. Jervis R. Troops do battle in, and against, searing heat. Precautions keep down severe cases. *USA Today*, August 8, 2006.
30. Diamond J. Insurgents' snipers sent after troops. *USA Today*, July 28–30, 2006.
31. Brook TV. Army makes way for older soldiers. *USA Today*, August 2, 2006.
32. Coote A. What health services could do about climate change. They must embrace sustainable development and reduce their ecological footprints. *BMJ* 2006;332(7554):1343–1344.
33. Haines A, Kovats RS, Campbell-Lendrum D, Corvalan C. Climate change and human health: impacts, vulnerability, and mitigation. *Lancet* 2006;367(9528):2101–2109.
34. Vergano D. High heat: the wave of the future? *USA Today*, August 3, 2006.
35. Heath B. Sweltering July just shy of the record. *USA Today*, August 8, 2006.
36. Hanley CJ. Blazes linked to global warming. *Dallas Morning News*, July 23, 2006.
37. Kuehn BM. "Polypill" could slash diabetes risks. *JAMA* 2006;296(4):377–380.
38. Brooks D. Neglecting our boys. *Dallas Morning News*, June 13, 2006.
39. Neuharth A. Still no. 1 on earth but sad 2nd in space. *USA Today*, July 7, 2006.
40. Jayson S. Society switches focus away from children. *USA Today*, July 12, 2006.
41. Albergotti R. The most inventive towns in America. *Wall Street Journal*, July 22, 2006.
42. Rubin R. Implantable contraceptive approved. *USA Today*, July 19, 2006.
43. Associated Press. FDA approves new contraceptive implanted in woman's arm. *Dallas Morning News*, July 19, 2006.
44. Cullen M. *Get It Together: Organize Your Records So Your Family Won't Have To.* Berkeley, CA: Nolo, 2005.
45. Block S. Plan funeral now to make sure you have the final word. *USA Today*, July 28, 2006.
46. Seitz R. Five best. *Wall Street Journal*, July 29–30, 2006.
47. Breitman R, Jones D. Should kids be left fortunes, or be left out? *USA Today*, July 26, 2006.
48. Neuharth A. Why parents should share $s with kids. *USA Today*, July 28, 2006.
49. Botter ME. Bats, man! *Dallas Morning News*, July 30, 2006.